Maine Poly, Inc.	**)**	**Departmental**
Androscoggin County	**)**	**Findings of Fact and Order**
Greene, Maine	**)**	**Air Emission License**
A-580-71-F-M	**)**	**Amendment #1**

After review of the air emissions license amendment application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Maine Poly, Inc. of Greene, Maine has applied to revise their air emission license to install a regenerative thermal oxidizer (RTO) to reduce volatile organic compound (VOC) emissions. This RTO unit will replace the current carbon adsorber. Maine Poly, Inc. manufactures flexible and antistatic packaging.

Maine Poly, Inc. is currently operating under air emission license A-580-74-B-N. A timely renewal application was submitted to the Bureau of Air Quality (A-580-71-C-R), in addition to a Title V major source application. Recently, Maine Poly, Inc. submitted an update to the renewal application. The update included a minor revision for the new control equipment (A-580-71-F-M).

This license addresses the revision. A renewal will be drafted separately. Based on the proposed limits in this license, Maine Poly, Inc. is not considered a Title V major source; therefore, the Title V submittal is no longer applicable.

B. Emission Equipment

This air emission license addresses the following equipment:

Process Equipment

Equipment	Web Width (in.)	Solvent Use	Control Device	Stack #
Unit 1 W&H Flexographic Press	44	37.8 lb/hr	RTO	1
Unit 2 Chadwick (6) Flexographic	32	37.8	RTO	1
Unit 3 Chadwick (8) Flexographic	60	50.4	RTO	1
Unit 4 Chadwick (8) Flexographic	42	50.4	RTO	1
Unit 5 Carraro Flexographic	50	37.8	RTO	1

Associated Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate (gal/hr)	Fuel Type, % sulfur	Stack #
Dryer for unit 2	0.35	3.9	propane	1
Dryer for unit 3	1 @ 1 MMBtu/hr 1@ 2 MMBtu/hr	33.1 total	propane	1
Dryer for unit 4	1.2	13.3	propane	1
Dryer for unit 5	1.5	16.6	propane	1
RTO control device	4.7	51.9	propane	1

C. Application Classification

The application for Maine Poly, Inc. includes the addition of the RTO which will decrease licensed VOC emissions. Since the proposed limits are under the major source thresholds, the application has been processed as a minor revision under the requirements of Chapter 115 of the Department's regulations.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in Chapter 100 of the Department's regulations. Separate

control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

Per Chapter 115 of the Department's regulations, replacement of an existing air pollution control system requires a demonstration that the new air pollution control system will achieve BPT.

Before proceeding with the control requirements for each unit, a general process description is provided to identify where the equipment fits into the process.

Process Description

Maine Poly, Inc. produces printed flexible and antistatic packaging using extruded polyethylene film.

Polyethylene pellets are received in rail cars and are unloaded into one of several storage silos. The pellets are extruded under pressure to form a thin film. The film is cut and shipped to the printing department.

The printing department consists of five printing presses. Currently, units 1 through 3 are primarily solvent ink presses and are connected to the existing carbon adsorber. Units 4 and 5 use water-based inks. Each discharges to the atmosphere. With the proposed RTO, all units will be exhausted into the RTO and all units will be allowed to use solvent-based inks.

Ink is applied to the raised portion of a rubber plate and transferred to the substrate with the central impression presses. Each color is added at a 'station' in the presses. The station consists of an ink reservoir and series of rollers to pick up ink and transfer it the plate and then the substrate. Each station has a drying stage for preliminary drying of one color before application of the next color. The substrate then goes to the dryer section where the remaining VOCs are evaporated and the ink is sufficiently dried to be rolled on the rewind spools.

Once out of the main dryer section of the presses, some of the orders are ready for shipment. Others are returned to the laminate department for a final lamination step to protect the printed image and some plastic sheets are cut and formed into bags or other packaging material.

B. Printing Press Control System

The controls for the presses involve two systems: the permanent total enclosure in conjunction with the regenerative thermal oxidizer.

1. Permanent Total Enclosure for the Printing Press Area

   VOC emissions from the printing presses occur in the drying phases. Each press contains two heaters, one for heating air for the drying between stations on the press and the second for makeup air to the drying oven. The Carraro and Chadwick heaters (on presses 2, 3, 4, and 5) are propane fired. The two heaters for the W&H press (press 1) are both electric. The presses have a heat recovery system which recycles a significant portion of the heated air between the drying stages of the printing operation.

   ME Poly, Inc. has proposed to make changes to qualify the press area as a permanent total enclosure by May 1, 2000. A permanent total enclosure is defined as a permanently installed enclosure that completely surrounds a source of emissions such that all VOC emissions are captured and contained for discharge through a control device. If the criteria of Chapter 126, Appendix A, Procedure T of the Department's regulations are met for a permanent total enclosure, then the VOC capture efficiency is assumed to be 100% and the capture efficiency need not be measured.

   The permanent total enclosure shall encompass the presses, ink storage around the presses, and roll cleaning and preparation. The permanent total enclosure shall vent to the RTO. Maine Poly, Inc. has the engineering data on the physical changes required to the pressroom to make it a permanent total enclosure including the addition of walls and/or strip curtains, ventilation modifications, and new dampers and duct systems to collect and deliver VOC from each press to the RTO.

2. <u>Regenerative Thermal Oxidizer (RTO)</u>

   Maine Poly, Inc. has proposed to install an RTO to replace the existing carbon adsorption system, providing greater VOC destruction for emissions from the presses. The RTO is proposed to be operational by May 1, 2000. A permanent total enclosure set up in conjunction with the RTO will eliminate questions related to capture efficiency, will provide a safer work environment for press operators and will eliminate the cost of disposal of hazardous waste generated by the solvent recovered in the existing carbon adsorber.

   Maine Poly, Inc. submitted a BACT analysis for the control of VOC from the printing presses. Control technologies in the RACT/BACT/LAER Clearing house for graphic arts printing, flexography, and rotogravure included: regenerative thermal oxidizers, catalytic incinerators, a fume incinerator, catalytic oxidizers, low solvent ink usage, and a permanent total enclosure with an RTO. Based on the control efficiencies of the technologies, the permanent total enclosure with an RTO is determined to be BACT.

The RTO shall consist of two columns filled with heat exchange media so that VOC laden air enters through the inlet heater where it is preheated before entering the combustion chamber. The propane fired burner (4.7 MMBtu/hr) in the combustion chamber raises the temperature to the operating set point where combustion of VOC is completed. The unit will operate in the range of 1600°F to 1800°F. The hot gases then pass through the second column of ceramic heat exchange media that is reheated by the gases.

A programmable logic controller (PLC) will control the column dampers in order to maintain 94% thermal efficiency. The system is designed for a 25,000 scfm volumetric flow, but will be able to operate at lower flow rates and will have a VOC destruction efficiency of 97%.

Fuel burning emissions from the RTO shall be limited to the following, based on 4.7 MMBtu/hr (51.9 gal/hr) from the RTO burner and a total of 6.05 MMBtu/hr (66 gal/hr) from the five dryer heaters. The emissions were calculated based on firing propane and using AP-42 factors:

Pollutant	Emission Factor AP-42 lb/1000 gal	lb/MMBtu	lb/hr	Annual Emissions from the RTO ton/year
PM	0.4	0.02	0.5	2.2
PM_{10}	0.4	--	0.5	2.2
SO_2	0.1S	--	0.001	0.004
NO_X	14	--	1.6	7.0
CO	3.2	--	0.38	1.66
VOC	0.5	--	0.06 (fuel burning) 8.2 (process)	0.26 (fuel burning) 36 (process)

Visible emissions from the RTO shall not exceed 10% opacity, except for six minutes in any one hour.

Maine Poly, Inc. has proposed a facility limit of 38 tons/year on a 12 month rolling total of VOC beginning in May 1, 2000. This is calculated as follows:

* 36 tons/year VOC from the from the presses exhausting through the RTO, with 100% capture efficiency and 97% destruction efficiency:
  Q lbs/yr x (1 ton/2000 lbs) x (1-0.97) = 36 tons/yr
  where Q = 2,400,000 lbs VOC from purchased alcohol plus alcohol and other VOC present in ink per year.
* 0.3 tons/year VOC from propane combustion, and
* 1.7 tons/year VOC from fugitive sources.

Per 38 M.R.S.A. Section 590 (5), In the event of a failure of the RTO, Maine Poly, Inc. has proposed to allow for a 'shutdown window'. This would encompass allowing jobs that are under way at the time of an RTO failure to be completed. This is needed since shutting down a print job in the middle of a run incurs significant scrap cost in film and ink. Maine Poly, Inc. has proposed a 24 hour limit shutdown time period for the presses if an RTO failure occurs. Maine Poly, Inc. shall keep records of when the RTO failure occurs, reason for failure, and the solvent usage when the presses operate without the RTO. VOC emissions shall not exceed a total annual limit of 10,000 lb (5 tons) on a 12 month rolling total basis, during this 'shutdown window' time period. The 5 tons/year shall be part of the facility wide cap of 38 tons/year.

Based on the above, the RTO operation, in conjunction with the permanent total enclosure, meets the requirements of Chapter 132 of the Department's regulations and BPT.

C. Fugitive VOC Emissions

The only uncontrolled source of fugitive VOC emissions will be the ink storage warehouse. Inks are stored in containers with sealed lids. Some fugitive emissions are released during mixing. It is estimated that VOC emissions from ink storage and mixing in the warehouse will be less than 1 ton/yr. However, for annual limits, Maine Poly, Inc. shall be limited to 1.7 tons/year VOC emissions from fugitive sources.

D. Period until May 1, 2000

Until the RTO is installed and operational, Maine Poly, Inc. shall continue to operate the existing presses and carbon adsorption system per the existing air emission license (A-580-74-B-N).

E. Annual Emission Restrictions

Beginning May 1, 2000 Maine Poly, Inc. shall be limited to the following annual emissions, based on a 12 month rolling total, calculated using emissions from the RTO and dryer heaters, and fugitive VOC emissions:

Total Allowable Annual Emission for the Facility
(used to calculate the annual license fee)

Pollutant	Tons/Year
PM	2.2
PM_{10}	2.2
SO_2	0.004
NO_x	7.0
CO	1.66
VOC	38

III. AMBIENT AIR QUALITY ANALYSIS

According to Chapter 115 of the Department's regulations, the level of air quality analyses required for a renewal source shall be determined on a case-by case basis. Modeling is not required for a renewal if the total emissions of any pollutant released do not exceed the following:

Pollutant	Tons/Year
PM	50
PM_{10}	25
SO_2	50
NO_x	100
CO	250

Based on the above total facility emissions, Maine Poly, Inc. is below the emissions level required for modeling.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants air emission license minor revision A-580-71-F-M subject to the conditions found in air emission license A-580-71-B-N and in the following conditions:

(26) Maine Poly, Inc. shall comply with all applicable requirements of Chapter 132 of the Department's regulations (Graphic Arts-Rotogravure and Flexography), including the requirements for the RTO control device, recordkeeping, and reporting.

(27) **Permanent Total Enclosure**

Maine Poly shall complete all renovations to the press room so that the room, including the roll storage area, satisfies all regulatory requirements as a permanent total enclosure in accordance with the specifications of Chapter 126, Appendix A, Procedure T. These requirements include, but are not limited to, the following:

a. Any natural draft opening shall be at least 4 equivalent opening diameters from each VOC emitting point.

b. The total area of all natural draft openings shall not exceed 5% of the surface area of the enclosures four walls, floor, and ceiling.

c. The average facial velocity of air through all natural draft openings shall be at least 3600 m/hr (200 feet/min). The direction of air through all natural draft openings shall be into the enclosure.

d. All access doors and windows whose areas are not included in the calculation in section (b) above shall be closed during routine operation of the process.

(28) **Regenerative Thermal Oxidizer**

a. Maine Poly, Inc. shall install a regenerative thermal oxidizer for the control of VOC from the press room. The RTO shall be in operation by May 1, 2000. The RTO shall have a VOC destruction efficiency of 97%. The destruction efficiency shall be determined in accordance with the procedures of Appendix A, Procedure E and F of Chapter 132 of the Department's regulations

b. For the RTO, Maine Poly, Inc. shall maintain the operating temperature no less than 28°C below the average combustion temperature during the most recent performance test that demonstrates the facility was in compliance, based on a 3 hour continuous time period.

c. Maine Poly, Inc. shall operate the RTO at all times that any press is operating, except for the shutdown window period time. In the event of a failure of the RTO, Maine Poly, Inc. shall comply with the following:
   i. Maine Poly, Inc. shall be limited to operating the presses to finish any current jobs up to a maximum of 24 hours if an RTO failure occurs (the 'shutdown window' time frame). Maine Poly, Inc. shall not start any new jobs until the RTO is repaired and on line.
   ii. Maine Poly, Inc. shall keep records of the solvent usage when the presses operate without the RTO and shall not exceed a total annual limit of 10,000 lb (5 tons) of VOC on a 12 month rolling total basis, during the 'shutdown window' time frame. The 5 tons/year shall be part of the facility wide cap of 36 tons/year from the presses.
   iii. Maine Poly, Inc. shall notify the Department on a quarterly basis of any periods of time operation occurred during the 'shutdown window' time frame. Maine Poly, Inc. shall also state the reason for failure, when repaired, and how to prevent reoccurance of the failure.

d. The RTO shall be equipped with continuous combustion temperature measurement equipment and a continuous recorder with an accuracy of +/- 1% of the combustion temperature measured in degrees Celsius or +/- 0.5°C, whichever is greater (per Chapter 132, Appendix A, Procedure E, section (b)(2)(ii)). The continuous monitoring equipment shall monitor combustion chamber temperature (per Chapter 132, Appendix A, Procedure E, section (b)(2)(i)(A)).

e. For the RTO, Maine Poly, Inc. shall maintain a record of all continuous 3-hour periods of operation (calculated on a 1 hour rolling basis) in which the average combustion temperature was more than 28°C (50°F) below the average combustion temperature during the most recent performance test that demonstrated the facility was in compliance (per Chapter 132, Section (7)(D)(2)(I)).

f. Maine Poly, Inc. shall maintain a log of operating time for the RTO and monitoring equipment (per Chapter 132, Section (7)(D)(2)(g)).

g. Maine Poly, Inc. shall keep a maintenance log for the capture system, RTO, and temperature monitoring equipment detailing all routine and non-routine maintenance performed, including dates and duration of any outages (per Chapter 132, Section (7)(D)(2)(h)).

h. Maine Poly, Inc. shall develop a quality assurance plan to insure that the quality assurance measures in Chapter 132, Appendix A, Procedure H and the quality control procedures in Procedure F are met with respect to the

temperature measuring and recording equipment (per Chapter 132, Appendix A, Procedure E, section (b)(2)(iii)).

i. Emissions from the RTO shall be limited to the following, based on 4.7 MMBtu/hr (51.9 gal/hr) from the RTO burner, a total of 6.05 MMBtu/hr (66 gal/hr) from the five dryer heaters all firing propane, and press emissions:

Pollutant	lb/MMBtu	lb/hr	Annual Emissions from the RTO ton/year
PM	0.02	0.5	2.2
PM_{10}	--	0.5	2.2
SO_2	--	0.001	0.004
NO_X	--	1.6	7.0
CO	--	0.38	1.66
VOC	--	8.3	36.3

j. Visible emissions from the RTO shall not exceed 10% opacity, except for six minutes in any one hour.

(29) **VOC Emissions/Records – From May 1, 2000 Forward**

a. Maine Poly, Inc. shall comply with the recordkeeping requirements of Chapter 132 of the Department's regulations by compiling monthly volumes of VOC content of alcohol and ink used as a total (rather than press-by-press basis) since the press room qualifies as a total permanent enclosure.

b. Beginning May 1, 2000, Maine Poly, Inc. shall be limited to 2,400,000 lbs VOC/year from solvents and inks on the presses, based on a 12 month rolling total. The 12 month rolling total shall begin with May 2000 as the first month. Taking into account the efficiency of the RTO, this equates to 36 tons/year of VOC emissions. Records of solvent and ink VOC content and usage shall be maintained documenting this limit on a monthly and 12 month rolling total basis.

c. Maine Poly, Inc. shall be limited to 10,000 lb/year VOC emissions (5 tons) from solvent and ink usage during the shutdown window periods of time that the RTO incurs failure (per condition (28)(b)(ii) above), calculated as a 12 month rolling total. VOC records shall be maintained documenting this limit on a monthly and 12 month rolling total basis.

d. Maine Poly, Inc. shall be limited to 1.7 tons/year VOC emissions from fugitive sources, including storage and mixing. VOC records shall be

calculated to document this limit on a monthly and 12 month rolling total basis.

e. The Department may re-evaluate the VOC emission limit from the facility once the RTO is operating and testing has occurred.

(30) **Compliance Testing**

a. Within 120 days of startup of the RTO, Maine Poly, Inc. shall conduct a compliance test for VOCs in accordance with Appendix A, Procedures E and F of Chapter 132 of the Department's regulations. In conjunction with determining the destruction efficiency of the RTO, the testing shall include all measurements of air flow into and out from the press room to document that the press room qualifies as a permanent total enclosure in accordance with Chapter 126, Appendix A, Procedure T of the Department's regulations. Test results shall be submitted to the Department within 30 days after testing is complete.

b. Maine Poly, Inc. shall conduct an annual compliance test each year in accordance with Appendix A, Procedures E and F of Chapter 132 of the Department's regulations. In conjunction with determining the destruction efficiency of the RTO, the testing shall include all measurements of air flow into and out from the press room to document that the press room qualifies as a permanent total enclosure in accordance with Chapter 126, Appendix A, Procedure T of the Department's regulations. Test results shall be submitted to the Department within 30 days after testing is complete.

(31) **Storage**

Fugitive VOC emissions shall be minimized by covering containers with vapor tight lids on fresh or spent VOC and cleanup materials.

(32) **Facility Emissions**

Facility emissions shall be limited to the following, based on a 12 month rolling total:

Pollutant	**Tons/Year**
PM	0.22
PM_{10}	0.22
SO_2	0.004
NO_x	7.0
CO	1.66
VOC	38

(33) The term of this Order shall be concurrent with air emission license A-580-74-B-N.

DONE AND DATED IN AUGUSTA, MAINE THIS DAY OF , 2000.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:_____
MARTHA G. KIRKPATRICK, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: December 29, 1999
Date of application acceptance: January 7, 2000

Date filed with the Board of Environmental Protection: _____

This Order prepared by Kathleen E. Neil, Bureau of Air Quality.